

5 Testing Readiness for Use

Readiness for use must be tested after replacing the ventilation valve, after care/assembly is carried out, and at least every six months.

The testing must be recorded in the ventilator logbook.

- Connecting the Test Lung 84 03 201.

The test lung consists of an elbow connector for connection to the Y-piece, a ø 7 catheter connector to simulate the resistance of the airways and a 2-L breathing bag to simulate the compliance.

- Disconnect the angle connector from the flow sensor.
- Plug the elbow connector into the patient connection of the flow sensor.
- To connect the gas supply, open the cylinder valve slowly and then open it fully or push the gas probe firmly into the piped medical gas outlet until it engages.

5.1 Testing the Ventilation Function

- Set the **VT** rotary knob to 0.5 L.
- Set the **Freq.** rotary knob to 12/min.
- Set the **TI:TE** rotary knob to 1:2.
- Set the **Pmax** rotary knob to 60 mbar.
- Set the **PEEP** rotary knob to 5 mbar.
- Set the switch for ventilation modes to **IPPV**.
- Set the power switch to I (ON).

The equipment carries out an electrical and pneumatic self-test.

Display:

Self test
Software xx.xx

The software version is displayed in the bottom line.

The red alarm LED and the lighting for the display come on briefly.

The audible alarm (single tone) sounds twice. For safety reasons, the alarm is given on two independent channels. Both are checked during the self-test. Therefore, the audible alarm sounds twice for the same length of time.

The green "DC power available" stays on when the ventilator is connected to an external power supply 11 to 13 V DC.

The self-test is completed after 6 seconds (at the latest).

Display:

Self-test O.K.

Oxylog 2000 ventilates the test lung with the adjusted ventilation pattern.

The manometer display, alternating between inspiration and expiration, should indicate a defined inspiratory pressure and an endexpiratory pressure of approx. 5 mbar.

The display should show a minute volume of **MV = 6 L/min** (with a tolerance of ± 1.0 L/min). (If the tolerance is higher, replace the flow sensor.)

- Disconnect the test lung.

Display after approx. 25 seconds:

Meas. value MV = 0
Paw low

- Re-connect the test lung.

After approx. 25 seconds, the alarm sound should stop.

- Reset the display = press 

5.2 Checking the Positive Endexpiratory Pressure PEEP

- Set the **PEEP** rotary knob to 0 mbar.
- Display on the manometer at end of expiration: **0 mbar** (± 2 mbar tolerance)
- Set the **PEEP** rotary knob to 10 mbar.
- Display on the manometer at the end of expiration: **10 mbar** (± 2 mbar tolerance)
- Set the **PEEP** rotary knob to 0 mbar again.

5.3 Checking the „Paw high“ Alarm

- Set the **VT** rotary knob to 1.0 L.
- Set the **Freq.** rotary knob to 5/min.
- Set the **TI:TE** rotary knob to 2:1.

- Set the **Pmax** rotary knob to 40 mbar.
- Keep the test lung compressed and watch the manometer.

At an airway pressure of 36 to 40 mbar the ventilator should switch over to expiration and the test lung empty itself.

The red alarm LED should flash and the following message appear on the display:

Paw high

The interval tone should start.

- Release the test lung.

The interval tone should stop.

- Reset the display = press **[A]**

5.4 Checking the „Paw low“ Alarm

- Set the **VT** rotary knob to 1.0 L.
- Set the **Freq.** rotary knob to 5/min.
- Set the **TI:TE** rotary knob to 2:1.
- Set the **Pmax** rotary knob to 40 mbar.
- Disconnect the test lung from the ventilation valve.

After approx. 25 seconds, the red alarm LED flashes and the following message appears:

Meas. value MV = 0
Paw low

The interval tone starts.

- Connect the test lung again.

The interval tone stops after approx. 25 seconds.

- Reset the display (press **[A]**).

5.5 Checking the Synchronization for SIMV

- Set the switch for ventilation modes to SIMV
- Set the **Pmax** rotary knob to 60 mbar.
- Set the **PEEP** rotary knob to 10 mbar.
- Simulate spontaneous breathing by compressing and releasing the test lung several times.

A synchronized ventilation stroke should follow within approx. 5 seconds. The synchronization was effective if an asterisk (*) appears briefly next to the measured value on the display.

Example:

MV = 6.0 L/min *

5.6 Testing the "Mains failure" Alarm

- Set the switch for ventilation modes to **IPPV**.
- Set the **PEEP** rotary knob to 0 mbar.
- Connect the external power supply (mains supply or DC/DC-converter)

The green LED should light.

- Disconnect the external power supply.

The red alarm LED should flash. The green LED should go out.

The following message appears:

Mains failure

The intermittent alarm sound should start. The Oxylog 2000 works with the internal supply.

- Reset the display (press **A**)

The intermittent alarm sound should stop.

The message "Mains failure" disappears.

- Connect the external power supply:
- Set the mains switch to 0.

When all tests have been successfully completed, the ventilator is ready for operation.

- Remove the test lung and mount the angle connector.

Checking ventilation

- 1 »VT« rotary knob to 0.5 L.
- 2 »Freq.« rotary knob to 12/min.
- 3 »TI : TE« rotary knob to 1 : 2.
- 4 »Pmax« rotary knob to 60 mbar.
- 5 »PEEP« rotary knob to 5 mbar.
- 6 Switch for ventilation modes to IPPV.

7 On/off switch to I (ON).

- The ventilator carries out an electrical and pneumatic self test.
- Display:

Self test
Software xx.xx

The software version being used is displayed on the lower line.

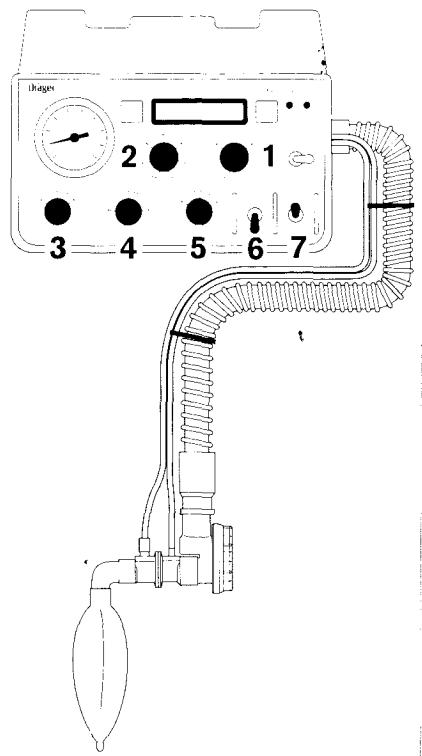
- The red alarm light and the illumination for the display are lit briefly.
- The alarm sound (single sound) is given twice. For safety reasons, the alarm sound is given on two channels independently of each other. Both are checked during the self test, and hence, the alarm sounds twice for the same length of time.
- The green »DC power available« light remains continuously lit when the ventilator is connected to an external power supply in the 11 to 13 V DC range.

The self test lasts no longer than 6 seconds.

- Display:

Self test O.K.

- Oxylog 2000 ventilates the test lung to the ventilation pattern set.



- The pressure gauge, alternating between inspiration and expiration, should indicate a defined inspiratory pressure and an end expiratory pressure of about 5 mbar.
- The display should show a minute volume of

$$MV = 6 \text{ L/min}$$

with a tolerance of $\pm 1.0 \text{ L/min}$.

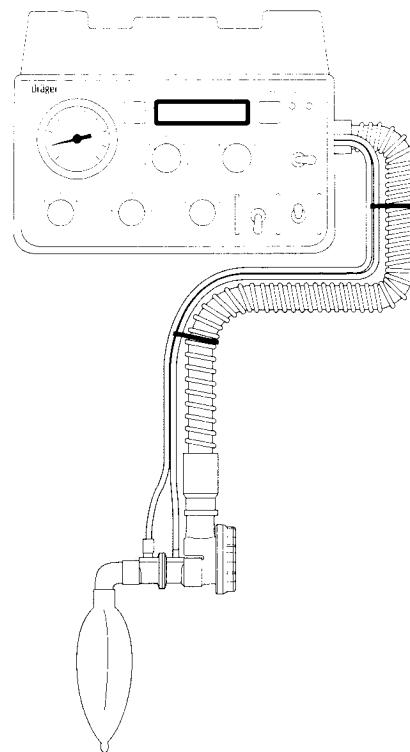
- Disconnect test lung.
- After about 25 seconds display:

Meas. value MV = 0
 Paw low

- Re-connect test lung.
- After about 25 seconds the intermittent alarm sound should cease.
- Reset the display = press  key.

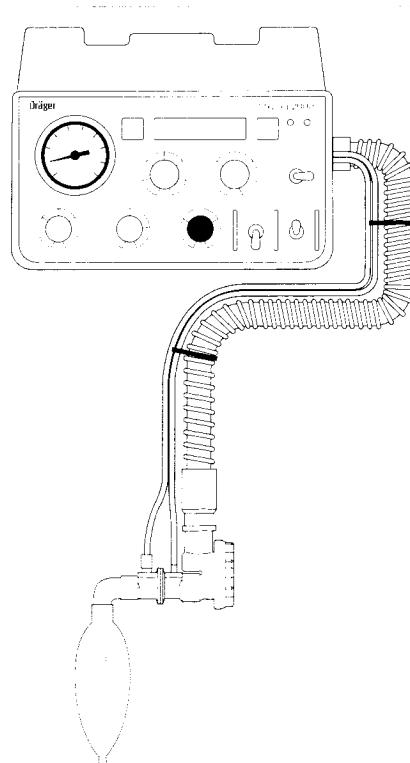
If the tolerance was too great:

- Replace flow sensor.



Checking end expiratory pressure PEEP

- »PEEP« rotary knob to 0 mbar.
- Display on pressure gauge at the end of expiration:
0 mbar ± 2 mbar tolerance
- »PEEP« rotary knob to 10 mbar.
- Display on pressure gauge at the end of expiration:
10 mbar ± 2 mbar tolerance
- »PEEP« rotary knob to 0 mbar again.



Testing Readiness for Operation

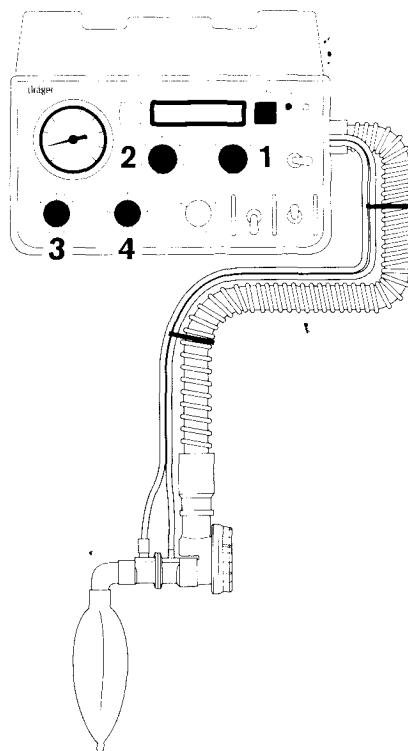
Checking »Paw high« alarm

Checking »Paw low« alarm

Checking »Paw high« alarm

- 1 »VT« rotary knob to 1.0 L.
- 2 »Freq.« rotary knob to 5/min.
- 3 »TI : TE« rotary knob to 2 : 1.
- 4 »Pmax« rotary knob to 40 mbar.

- Keep test lung compressed and watch pressure gauge.
- At an airway pressure of 36 to 40 mbar the ventilator should switch to expiration and the test lung empty itself.
- The red alarm light should flash and display show:



Paw high

the intermittent alarm sound should start.

- Release test lung.
- The intermittent sound should stop.
- Reset display = press  key.

Checking »Paw low« alarm

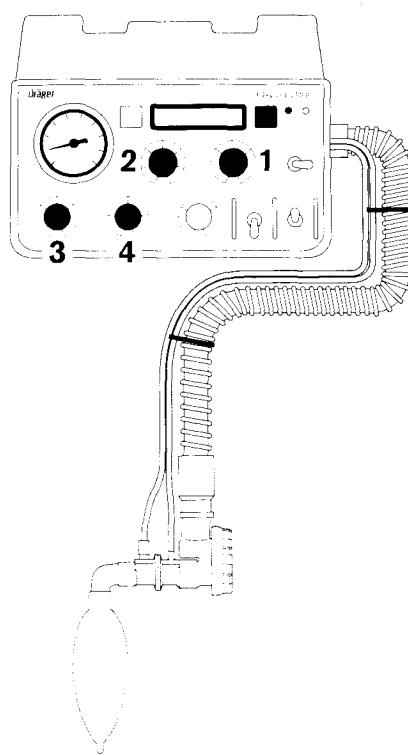
Using the existing setting.

- Remove test lung from ventilation valve.
- After about 25 seconds the red alarm light should flash and display show:

Paw low

the intermittent alarm sound should start.

- Re-connect test lung.
- After about 25 seconds the intermittent alarm sound should stop.
- Reset display = press  key.

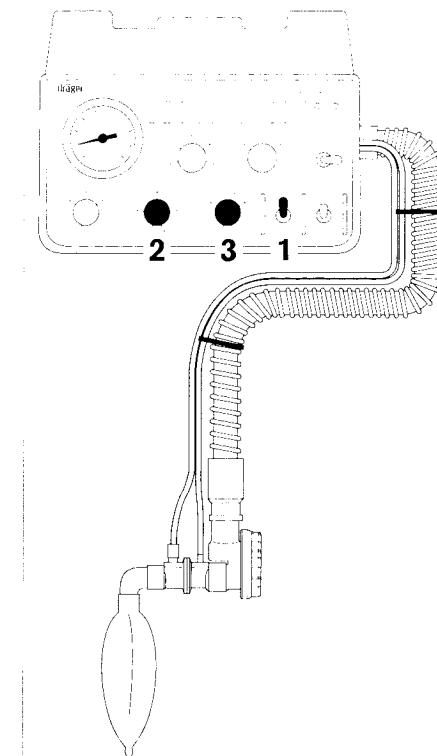


Checking synchronisation for SIMV

- 1 Switch for ventilation modes to SIMV.
- 2 »Pmax« rotary knob to 60 mbar.
- 3 »PEEP« rotary knob to 10 mbar.
- Simulate spontaneous breathing by compressing the test lung and then releasing it repeatedly.
- A synchronised ventilation stroke should follow within about 5 seconds.
 The synchronisation was effective if an asterisk (*) appears in the display after the measured value.
 Example:

MV = 6.0 L/min *

- 1 Switch for ventilation modes to IPPV.
- 3 »PEEP« rotary knob to 0.



Checking »mains failure« alarm

Using the existing setting.

- Connect external power supply (power pack or DC/DC converter).
 The green LED is lit.
- Interrupt external power supply: the red alarm light flashes and the green light goes out.
 Display shows:

Mains failure

intermittent tone commences.
 The ventilator continues to function using the internal power supply.

- Reset display = press 
 The intermittent tone stops.
 The message »Mains failure« disappears.
- Restore external power supply = main switch to 0.

When all the tests have been successfully completed, the machine is ready for operation.

- Remove test lung and re-attach angled connector.

Prolonged storage

When Oxylog 2000 is not going to be used for more than 3 months:

- Take out AlkMn battery pack.

The rechargeable NiCd battery pack may remain in the machine.